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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
DANIEL JR, WILLIE J	

ART UNIT	PAPER NUMBER
2617	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/998,489	HAYEK ET AL.	
	Examiner	Art Unit	
	Willie J. Daniel, Jr.	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,16-22 and 24-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-10* is/are allowed.

6)☒ Claim(s) *11,13,14,16-22 and 24-27* is/are rejected.

7)☒ Claim(s) *12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to applicant's amendment filed on 07 February 2005. **Claims 1-14, 16-22, 24-27** are now pending in the present application and **claims 15 and 23** are canceled. This office action is made **Non-Final**.

Response to Petition/Appeal

2. In addition to the above, this action is in response to applicant's petition filed on 02 February 2006.

3. In view of the Appeal Brief filed on 18 August 2004, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

Claim Objections

4. **Claims 17 and 26** are objected to because of the following informalities:

   a. Claim 17 recites the language "...of claim **15**, determining..." on line 1 of the claim. Applicant has **canceled** claim 15. The Examiner interprets as --of claim **27**, determining-- and requests correction of dependency for the claim.

   b. Claim 26 recite the limitation "...**the** n^{th} harmonic..." on line(s) 9 of the claim. The Examiner interprets as --n^{th} harmonic-- and suggests replacing said limitation to have proper **antecedent** and help clarify the claim language.

   c. Claim 26 recite the limitation "...the frequency divide ratio **q**..." on line(s) 11 of the claim. The Examiner interprets as -- the frequency divide ratio-- and suggests replacing said limitation to have proper **antecedent** and help clarify the claim language.

   d. Claim 26 recite the limitation "...**the** harmonic number n..." on line(s) 11 of the claim. The Examiner interprets as --**a** harmonic number n-- and suggests replacing said limitation to have proper **antecedent** and help clarify the claim language.

   Appropriate correction is required.

5. Due to the claim objections applied to unclear language of the instant application as originally filed, the Examiner has given a reasonable interpretation of said language and the claims are rejected as broadest and best interpreted.

6. This list of examples is not intended to be exhaustive. The Examiner respectfully requests the applicant to review all claims and clarify the issues as listed above as well as any other issue(s) that are not listed.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 26 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. **Claim 26** recites the limitation "...the frequency divide ratio q equals the harmonic number n..." in line(s) 11 of the claim.

Regarding **claim 26**, the claim recites language that is not clear and concise in which the Examiner respectfully request the applicant to clarify the claim. If the applicant considers the current language to be sufficient, the Examiner respectfully requests page(s), line(s), and/or drawing(s) of the instant application that supports the claim language and any supportive comment(s) to help clarify and resolve this issue(s).

8. Due to the *unclear* language of the claim, the Examiner has given a reasonable interpretation of said language and the claims are rejected as broadest and best interpreted

9. This list of examples is not intended to be exhaustive. The Examiner respectfully requests the applicant to review all claims and clarify the issues as listed above as well as any other issue(s) that are not listed.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11, 18, 24, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atkinson (US 6,731,923 B2)** in view of **Mouly et al.** (hereinafter Mouly) "The GSM System for Mobile Communications".

Regarding **claims 11, 18,** and **24**, Atkinson discloses a method in intermediate frequency and direct conversion receivers, comprising:

receiving a signal (see col. 3, lines 12-18; Fig. 2);

providing a local oscillator signal (34) which reads on the claimed "mixer injection frequency" by dividing a voltage controlled oscillator (VCO 38) output by a frequency divide ratio (see col. 3, lines 19-44; Fig. 2), where a frequency (e.g., 1.35 GHz) is different from the received frequency (e.g., 1.8 GHz),

the voltage controlled oscillator (38) having a frequency (e.g., F_3) outside received signal harmonics (see col. 3, lines 46-52; Fig. 2), where the signal is not harmonic;

mixing the received signal at a mixer injection frequency, outside a fundamental frequency of the received signal (see col. 3, lines 34-52; col. 4, lines 37-65; Fig. 2), where the system utilizes a RF input signal from a global system for mobile communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz and the output signal is not harmonic to the input signal. Atkinson does not specifically disclose having the feature

outside a bandwidth. However, the examiner maintains that the feature outside a bandwidth was well known in the art, as taught by Mouly.

In the same field of endeavor, Mouly discloses the feature outside a bandwidth (e.g., 200 kHz) (see pgs. 214-218, section 4.2.2.1; Fig. 4.17), where the channel bandwidth for a system (e.g., GSM) operating at 1800 MHz is 200kHz and the modulated spectrum is somewhat wider.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson and Mouly to have the feature outside a bandwidth, in order that any coupling of the input RF signal to the VCO should have a minimal effect on the operation of the VCO, as taught by Atkinson (see col. 3, lines 50-52).

Regarding **claim 27**, Atkinson discloses a method in intermediate frequency and direct conversion receivers, comprising:

receiving a signal (see col. 3, lines 12-18; Fig. 2);

providing a local oscillator signal (34) which reads on the claimed "mixer injection frequency" by dividing a voltage controlled oscillator (VCO 38) output by a frequency divide ratio (see col. 3, lines 19-44; Fig. 2), where a frequency (e.g., 1.35 GHz) is different from the received frequency (e.g., 1.8 GHz),

the voltage controlled oscillator (38) having a frequency (e.g., F_3) outside received signal harmonics (see col. 3, lines 46-52; Fig. 2), where the signal is not harmonic;

determining a condition of the received signal (see col. 4, lines 4-10), where the system determines a condition of interference;

mixing the received signal at a mixer injection frequency derived from a voltage controlled oscillator frequency that is outside the harmonics of the received signal only if the condition of the received signal is above a threshold (see col. 3, lines 34-52; col. 4, lines 37-65; Fig. 2), where the system utilizes a RF input signal from a global system for mobile communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz and the output signal is not harmonic to the input signal. Atkinson does not specifically disclose having the feature outside a bandwidth. However, the examiner maintains that the feature outside a bandwidth was well known in the art, as taught by Mouly.

Mouly further discloses the feature outside a bandwidth (e.g., 200 kHz) (see pgs. 214-218, section 4.2.2.1; Fig. 4.17), where the channel bandwidth for a system (e.g., GSM) operating at 1800 MHz is 200kHz and the modulated spectrum is somewhat wider.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson and Mouly to have the feature outside a bandwidth, in order that any coupling of the input RF signal to the VCO should have a minimal effect on the operation of the VCO, as taught by Atkinson (see col. 3, lines 50-52).

Claims 13-14 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atkinson (US 6,731,923 B2)** in view of **Mouly et al.** (hereinafter Mouly) "The GSM System for Mobile Communications" as applied to claim 11 above, and further in view of **Atkinson et al.** (hereinafter Atkinson '518) **(US 6,731,923 B2)**.

Regarding **claim 13**, the combination of Atkinson and Mouly discloses every limitation claimed, as applied above, (see claim 11), in addition Atkinson further discloses that the frequency divide ratio can be selected such that the received signal is mixed at a local oscillator frequency outside a bandwidth of a fundamental frequency of a received signal (e.g., outside the channel bandwidth of 200 kHz) (see col. 3, lines 34-52; col. 4, lines 37-65), where the system can operate at 1800 MHz with a channel bandwidth of 200 kHz that in not harmonic. As a note, Atkinson discloses selecting a frequency divide ratio equal to one that would accommodate the system by maintaining local oscillator frequency outside the bandwidth of harmonics or a fundamental frequency of the received signal in order to prevent leakage of the local oscillator frequency. The combination of Atkinson and Mouly does not specifically disclose having the feature dividing the voltage controlled output by a frequency divide ratio equal to one. However, the examiner maintains that the feature dividing the voltage controlled output by a frequency divide ratio equal to one was well known in the art, as taught by Atkinson '518.

In the same field of endeavor, Atkinson '518 discloses the feature dividing the voltage controlled output by a frequency divide ratio equal to one (see col. 6, lines 30-33; col. 5, lines 51-58), where the values of m and n can be selected to achieve the needed result in which equal to one would be inherent to provide the appropriate ratio.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson, Mouly, and Atkinson '518 to have the feature dividing the voltage controlled output by a frequency divide ratio equal to one, in order to provide a direct conversion receiver or transmitter that has reduced leakage or interference between the radio frequency input signal and the local oscillator, as taught by Atkinson '518 (see col. 2, lines 63-67).

Regarding **claim 26**, Atkinson discloses a method in intermediate frequency and direct conversion receivers, comprising:

receiving a signal (see col. 3, lines 12-18; Fig. 2);

providing a local oscillator signal (34) which reads on the claimed "mixer injection frequency" by dividing a voltage controlled oscillator (VCO 38) output by a frequency divide ratio (see col. 3, lines 19-44; Fig. 2), where a frequency (e.g., 1.35 GHz) is different from the received frequency (e.g., 1.8 GHz),

the voltage controlled oscillator (38) having a frequency (e.g., F_3) outside received signal harmonics (see col. 3, lines 46-52; Fig. 2), where the signal is not harmonic;

mixing the received signal at a mixer injection frequency derived from a VCO frequency that is outside the n^{th} harmonic of the received signal (see col. 3, lines 34-52; col. 4, lines 37-65; Fig. 2), where the system utilizes a RF input signal from a global system for mobile communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz and the output signal is not harmonic to the input signal,

the frequency divide ratio q equals the harmonic number n (see col. 3, lines 34-52; col. 4, lines 37-65; Fig. 2), where the system output signal is not harmonic. Atkinson does not

specifically disclose having the feature outside a bandwidth. However, the examiner maintains that the feature outside a bandwidth was well known in the art, as taught by Mouly.

Mouly further discloses the feature outside a bandwidth (e.g., 200 kHz) (see pgs. 214-218, section 4.2.2.1; Fig. 4.17), where the channel bandwidth for a system (e.g., GSM) operating at 1800 MHz is 200kHz and the modulated spectrum is somewhat wider.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson and Mouly to have the feature outside a bandwidth, in order that any coupling of the input RF signal to the VCO should have a minimal effect on the operation of the VCO, as taught by Atkinson (see col. 3, lines 50-52). However, the examiner maintains that the feature the frequency divide ratio q equals the harmonic number n was well known in the art, as taught by Atkinson '518.

Atkinson '518 further discloses the feature the frequency divide ratio q equals the harmonic number n (see col. 3, lines 58-62; col. 6, lines 30-33; col. 5, lines 51-58), where the values of m and n can be selected to achieve the needed result in which equal to one would be inherent to provide the appropriate ratio.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson, Mouly, and Atkinson '518 to have the feature the frequency divide ratio q equals the harmonic number n, in order to provide a direct conversion receiver or transmitter that has reduced leakage or interference between the radio frequency input signal and the local oscillator, as taught by Atkinson '518 (see col. 2, lines 63-67).

Regarding **claim 14**, the combination of Atkinson and Mouly discloses every limitation claimed, as applied above, (see claim 26), in addition Atkinson further discloses that the frequency divide ratio can be selected such that the received signal is mixed at a local oscillator frequency outside a bandwidth of a fundamental frequency of a received signal (e.g., outside the channel bandwidth of 200 kHz) (see col. 3, lines 34-52; col. 4, lines 37-65), where the system can operate at 1800 MHz with a channel bandwidth of 200 kHz that in not harmonic. As a note, Atkinson discloses selecting a frequency divide ratio equal to one that would accommodate the system by maintaining local oscillator frequency outside the bandwidth of harmonics or a fundamental frequency of the received signal in order to prevent leakage of the local oscillator frequency. The combination of Atkinson and Mouly does not specifically disclose having the feature dividing the voltage controlled output by a frequency divide ratio greater than one. However, the examiner maintains that the feature dividing the voltage controlled output by a frequency divide ratio greater than one was well known in the art, as taught by Atkinson '518.

Atkinson '518 further discloses the feature dividing the voltage controlled output by a frequency divide ratio greater than one (see col. 6, lines 30-33; col. 5, lines 51-58), where the values of m and n can be selected to achieve the needed result in which equal to one would be inherent to provide the appropriate ratio.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson, Mouly, and Atkinson '518 to have the feature dividing the voltage controlled output by a frequency divide ratio greater than one, in order to provide a direct conversion receiver or transmitter that has reduced

leakage or interference between the radio frequency input signal and the local oscillator, as taught by Atkinson '518 (see col. 2, lines 63-67).

Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atkinson (US 6,731,923 B2)** in view of **Mouly et al.** (hereinafter Mouly) "The GSM System for Mobile Communications" as applied to claim 27 above, and further in view of **Freed (US 6,487,419 B1)**.

Regarding **claim 16**, the combination of Atkinson and Mouly discloses every limitation claimed as applied above in claim 27. As a note, Atkinson discloses of the system determining a condition of interference (see col. 4, lines 4-10), where a condition such as interference can affect the received signal strength (RSS). The combination of Atkinson and Mouly does not specifically disclose having the feature determining the condition of the received signal by determining a strength thereof. However, the examiner maintains that the feature determining the condition of the received signal by determining a strength thereof was well known in the art, as taught by Freed.

In the same field of endeavor, Freed discloses the feature determining the condition of the received signal by determining a strength thereof (see abstract; col. 2, line 20 - col. 3, line 26; col. 4, line 58 - col. 5, line 18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson, Mouly, and Freed to have the feature determining the condition of the received signal by determining a strength thereof, in order to improve power management in wireless telephones while still meeting the signal

handling requirements of the modes of operation of the wireless telephones, as taught by Freed (see col. 2, lines 1-4).

Regarding **claim 17**, the combination of Atkinson and Mouly discloses every limitation claimed as applied above in claim 27. As a note, Atkinson discloses of the system determining a condition of interference (see col. 4, lines 4-10), where a condition such as interference can effect the received signal strength (RSS). The combination of Atkinson and Mouly does not specifically disclose having the feature determining the condition of the received signal by determining a signal strength and bit error rate (BER) thereof, increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold. However, the examiner maintains that the feature determining the condition of the received signal by determining a signal strength and bit error rate (BER) thereof, increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold was well known in the art, as taught by Freed.

Freed further discloses the feature determining the condition of the received signal by determining a signal strength and bit error rate (BER) thereof, increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold (see abstract; col. 2, line 20 - col. 3, line 26; col. 4, line 58 - col. 5, line 18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson, Mouly, and Freed to have the feature determining the condition of the received signal by determining a signal strength and bit error rate (BER) thereof, increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold, in order to improve power management in

wireless telephones while still meeting the signal handling requirements of the modes of operation of the wireless telephones, as taught by Freed (see col. 2, lines 1-4).

Claims 19 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Arpaia et al.** (hereinafter Arpaia) (**US 6,192,225 B1**) in view of well known prior art (**MPEP 2144.03**).

Regarding **claims 19 and 25**, Arpaia discloses a method in an RF receiver (see Fig. 2), comprising:

receiving a signal within a passband of a preselector filter (1) which reads on the claimed "pre-selection filter" of the receiver (see col. 3, lines 20-25; col. 4, lines 1-6; Fig. 2);

mixing the received signal at a mixer injection (e.g., local oscillator) frequency f_0 outside the passband of the pre-selection filter (1) (see col. 4, lines 47-50; col. 4, line 58 - col. 5, line 3; Fig. 2);

chopping the received signal after mixing at the same chopper frequency, the chopper frequency proportional to the mixer injection frequency f_0 (see col. 4, lines 21-57). Arpaia does not specifically disclose the feature chopping the signal before mixing. However, the examiner takes official notice of the fact that it was well known in the art to have the feature chopping the signal before mixing.

As a note, one of ordinary skill in the art would clearly recognize that the feature chopping the signal before mixing is common knowledge. For example, Arpaia discloses the received signal is not affected by the phase change element (5) and inverters (9, 9' "chop-up").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Arpaia by specifically having the feature chopping the signal before mixing, for the purpose of improving the elimination of second-order products of the received signal (see Arpaia -col. 4, lines 34-50).

Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Arpaia et al.** (hereinafter Arpaia) (**US 6,192,225 B1**) in view of well known prior art (**MPEP 2144.03**) as applied to claim 19 above, and further in view of **Freed** (**US 6,487,419 B1**).

Regarding **claim 20**, Arpaia discloses every limitation claimed as applied above in claim 19. Arpaia does not specifically disclose having the feature increasing a gain of the received signal before mixing if the received signal gain is below a threshold. However, the examiner maintains that the feature increasing a gain of the received signal before mixing if the received signal gain is below a threshold was well known in the art, as taught by Freed.

In the same field of endeavor, Freed discloses the feature increasing a gain of the received signal before mixing if the received signal gain is below a threshold (see abstract; col. 2, line 20 - col. 3, line 26; col. 4, line 58 - col. 5, line 18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of modified Arpaia and Freed to have the feature increasing a gain of the received signal before mixing if the received signal gain is below a threshold, in order to improve power management in wireless telephones while still meeting the signal handling requirements of the modes of operation of the wireless telephones, as taught by Freed (see col. 2, lines 1-4).

Regarding **claim 21**, Arpaia discloses every limitation claimed as applied above in claim 19. Arpaia does not specifically disclose having the feature determining a gain of the received signal, mixing the received signal at the mixer injection frequency outside the passband of the pre-selection filter when the measured gain is above a threshold, mixing the received signal at a mixer injection frequency within the passband of the pre-selection filter ff the measured gain is below the threshold. However, the examiner maintains that the feature determining a gain of the received signal, mixing the received signal at the mixer injection frequency outside the passband of the pre-selection filter when the measured gain is above a threshold, mixing the received signal at a mixer injection frequency within the passband of the pre-selection filter ff the measured gain is below the threshold was well known in the art, as taught by Freed.

Freed further discloses the feature determining a gain of the received signal, mixing the received signal at the mixer injection frequency outside the passband of the pre-selection filter when the measured gain is above a threshold, mixing the received signal at a mixer injection frequency within the passband of the pre-selection filter ff the measured gain is below the threshold (see abstract; col. 2, line 20 - col. 3, line 26; col. 4, line 58 - col. 5, line 18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of modified Arpaia and Freed to have the feature determining a gain of the received signal, mixing the received signal at the mixer injection frequency outside the passband of the pre-selection filter when the measured gain is above a threshold, mixing the received signal at a mixer injection frequency within the

passband of the pre-selection filter if the measured gain is below the threshold, in order to improve power management in wireless telephones while still meeting the signal handling requirements of the modes of operation of the wireless telephones, as taught by Freed (see col. 2, lines 1-4).

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Arpaia et al.** (hereinafter Arpaia) (**US 6,192,225 B1**) in view of well known prior art (**MPEP 2144.03**), and further in view of **Atkinson** (**US 6,731,923 B2**) in view of **Mouly et al.** (hereinafter Mouly) "The GSM System for Mobile Communications".

Regarding **claim 22**, Arpaia discloses a method in intermediate frequency and direct conversion receivers (see Fig. 2). As a note, Arpaia discloses chopping the received signal after mixing at the same chopper frequency, the chopper frequency proportional to the mixer injection frequency f_0 (see col. 4, lines 21-57), where the system receives a signal that is chopped up. Arpaia does not specifically disclose the features chopping a received signal; mixing the received signal after chopping at a mixer injection frequency. However, the examiner takes official notice of the fact that it was well known in the art to have the features chopping a received signal; mixing the received signal after chopping at a mixer injection frequency.

As a note, one of ordinary skill in the art would clearly recognize that the features chopping a received signal; mixing the received signal after chopping at a mixer injection frequency is common knowledge. For example, Arpaia discloses the received signal is not affected by the phase change element (5) and inverters (9, 9' "chop-up").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Arpaia by specifically having the features chopping a received signal; mixing the received signal after chopping at a mixer injection frequency, for the purpose of improving the elimination of second-order products of the received signal (see Arpaia -col. 4, lines 34-50). The modified Arpaia does not specifically disclose having the features providing a mixer injection frequency derived from a voltage controlled oscillator frequency outside a bandwidth of received signal harmonics by dividing a voltage controlled oscillator output by a frequency divide ratio, a harmonic of the received signal corresponding to the divide ratio of the frequency divider. However, the examiner maintains that the feature providing a mixer injection frequency derived from a voltage controlled oscillator frequency outside a bandwidth of received signal harmonics by dividing a voltage controlled oscillator output by a frequency divide ratio, a harmonic of the received signal corresponding to the divide ratio of the frequency divider was well known in the art, as taught by Atkinson.

In the same field of endeavor, Atkinson discloses the features

providing a local oscillator signal (34) which reads on the claimed "mixer injection frequency" derived from a voltage controlled oscillator (VCO 38) outside received signal harmonics by dividing a controlled oscillator output by a frequency divide ratio (see col. 3, lines 19-44; Fig. 2), where a frequency (e.g., 1.35 GHz) is different than the received frequency (e.g., 1.8 GHz),

a harmonic of the received signal (e.g., F_3) corresponding to the divide ratio of the frequency divider (see col. 3, lines 34-52; col. 4, lines 37-65; Fig. 2), where the system utilizes a RF input signal from a global system for mobile communication (GSM) operating

at 1800 MHz and a VCO frequency at 1350 MHz and the output signal is not harmonic to the input signal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the modified Arpaia and Atkinson to have the feature providing a mixer injection frequency derived from a voltage controlled oscillator frequency outside a bandwidth of received signal harmonics by dividing a voltage controlled oscillator output by a frequency divide ratio, a harmonic of the received signal corresponding to the divide ratio of the frequency divider, in order to provide a direct conversion receiver or transmitter that has reduced leakage or interference between the radio frequency input signal and the local oscillator, as taught by Atkinson (see col. 2, lines 42-46). The combination of the modified Arpaia and Atkinson does not specifically disclose having the feature outside a bandwidth. However, the examiner maintains that the feature outside a bandwidth was well known in the art, as taught by Mouly.

In the same field of endeavor, Mouly discloses the feature outside a bandwidth (e.g., 200 kHz) (see pgs. 214-218, section 4.2.2.1; Fig. 4.17), where the channel bandwidth for a system (e.g., GSM) operating at 1800 MHz is 200kHz and the modulated spectrum is somewhat wider.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the modified Arpaia, Atkinson, and Mouly to have the feature outside a bandwidth, in order that any coupling of the input RF signal to the VCO should have a minimal effect on the operation of the VCO, as taught by Atkinson (see col. 3, lines 50-52).

Allowable Subject Matter

11. Claims 1-10 allowed.

12. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons For Allowance

13. The following is a statement of reasons for the indication of allowable subject matter:

    a. Regarding **claims 1**, **5**, and **12**, the combination of the applied references fails to disclose or render obvious, the features of the claims.

Response to Arguments

14. Applicant's arguments with respect to claims 11, 13-14, 16-22, and 24-27 have been considered but are moot in view of the new ground(s) of rejection necessitated by the amended language, new limitations, and/or new claims.

In response to applicant's arguments, the Examiner respectfully disagrees as the applied reference(s) provide more than adequate support and to further clarify (see the above claims for relevant citations and comments in this section).

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Molnar et al. (US 7,149,493 B2) discloses a direct conversion receiver employing subharmonic frequency translator architecture and related preprocessor.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Willie J. Daniel, Jr. whose telephone number is (571) 272-7907. The examiner can normally be reached on 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Appiah can be reached on (571) 272-7904. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information

for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/WJD,JR/

WJD,JR
03 August 2007

CHARLES N. APPIAH
SUPERVISORY PATENT EXAMINER